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10/595,694	05/05/2006	Stewart Young	PHIDE030385US	4933

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EXAMINER

CHANG, JON CARLTON

ART UNIT

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2624

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/595,694

**Applicant(s)**

YOUNG ET AL.

**Examiner**

JON CHANG

**Art Unit**

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/02)  
Paper No(s)/Mail Date 05/05/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

***Specification***

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

**Arrangement of the Specification**

2. As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

3. The disclosure is objected to because of the following informalities: the specification refers to specific claims in describing the invention (page 2, lines 9 and 16).

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 3 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claim 3 is not clear. There may be words missing from the claim.
7. Claim 10 recites, "said computer program product." There is insufficient antecedent basis for this term in the claim.

***Claim Rejections - 35 USC § 101***

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1-7 and 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.
10. Claims 1-7 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit<sup>1</sup>, relying upon Supreme Court precedent<sup>2</sup>, has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a

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<sup>1</sup> *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

<sup>2</sup> *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor are positively tied to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. Consider claim 1. The claim is not tied to a particular machine because the steps in the body of the claim could reasonably be construed as being performed manually. The claim also does not satisfy the transformation test, as it does not transform a particular article to a different state or thing. No physical transformation is claimed. Additionally: 1) the data (i.e., the image) is not required to represent a real world/physical object ("tubular structure" is not necessarily a real world/physical object, as it could be purely graphical); 2) there is no external, non-data representation of the physical object represented by the modified data (a "view" and "visualizing" broadly encompasses a person looking at or even imagining the claimed object). The dependent claims do not add anything which would cause the claims to become statutory. In order to obviate this rejection, the Examiner suggests either one of the following options: 1) include language in the claim which requires meaningful and significant steps (such as the generating and representing steps) be performed by a particular machine (i.e., not a generic "machine" or "device"); or, 2) require that the

object is a real world or physical object, and include an additional step which requires depiction of a non-data representation (this could be a visual depiction) of the resulting image. Any language added to the claims must find support in the original disclosure, in order to avoid a rejection under 35 U.S.C. 112, 1st paragraph (new matter).

11. Claim 10 is drawn to a computer program *per se*. Computer programs are not physical “things.” They are neither computer components nor statutory processes, as they are not “acts” being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program’s functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program’s functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

### ***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication 20050122343 to Bailey et al. (hereinafter after referred to as "Bailey"). It is pointed out that Bailey qualifies as a reference under section 102(e) by the international filing date of the PCT application upon which it is based since the PCT application was published in English and designated the United States.
14. With regard to claim 1, Bailey discloses a method of visualization of a tubular structure ([0061], "blood vessels" or "colon") of an object by use of a 3D image data set of said object, comprising the steps of:

generating and visualizing a curved planar reformation view ([0060]) from a symbolic pathway view of said tubular structure ([0064]-[0065]; the curve is a symbolic pathway), said symbolic pathway view representing said tubular structure ([0061]) and the pathway points of said symbolic pathway being assigned with their 3D spatial position data ([0065], [0069]-[0070]) and

generating and visualizing at least one planar view of said object through a viewing point of said tubular structure selected in said curved planar reformation view or said symbolic pathway view ([0078], [0079], [0091]).

15. As to claim 2, Bailey discloses the method as claimed in claim 1, wherein said at least one planar view is generated by use of the 3D spatial position data assigned to the selected viewing point ([0061] last sentence, [0078], [0079], [0091]).

16. As to claim 3, Bailey discloses the method as claimed in claim 1, wherein three orthogonal views are generated and visualized which intersect in the selected viewing point ([0069]).

17. As to claim 4, Bailey discloses the method as claimed in claim 1, wherein said symbolic pathway view of said tubular structure is obtained following segmentation of said tubular structure in said 3D image data set (last sentence of [0071], effectively teaches segmenting the anatomical structure).

18. As to claim 5, Bailey discloses a method as claimed in claim 1, wherein said step of generating and visualizing said curved planar reformation view includes a step of selecting a viewing direction and a viewing up direction determining the viewing angle of said curved planar reformation view ([0021], [0091]).

19. As to claim 6, Bailey discloses a method as claimed in claim 1, wherein the selection of said a viewing point can be interactively changed, wherein after selection of a new viewing point said at least one planar view through said new viewing point is newly generated and visualized ([0091]).

20. As to claim 7, Bailey discloses a method as claimed in claim 1, wherein said tubular structure is a vessel, bone, airway, colon or spine of a patient ([0061], line 18) and wherein said 3D image data set is a medical image data set, in particular a 3D rotational angiography, CT angiography or MR data set ([0060]).



21. With regard to claim 8, Bailey discloses an apparatus (Fig.13) for visualization of a tubular structure of an object by use of a 3D image data set of said object, comprising:

means for storing said 3D image data ([0167], "storage device"; [0060]);

means for generating a curved planar reformation view from a symbolic pathway view of said tubular structure, said symbolic pathway view representing said tubular structure and the pathway points of said symbolic pathway being assigned with their 3D spatial position data ([0060], [0061]);

means for storing said 3D spatial position data of said symbolic pathway ([0167], "storage device"; [0065]-[0066]);

means for generating at least one planar view of said object through a viewing point of said tubular structure selected in said curved planar reformation view or said symbolic pathway view ([0078], [0079], [0091]),

means for visualizing said symbolic pathway view, said curved planar reformation view and said at least one planar view (Fig.13, note displays for workstations 154; [0091]), and

means for selecting a viewing point in said curved planar reformation view or said symbolic pathway view ([0091]).

22. As to claim 9, Bailey discloses an apparatus for acquiring and processing medical image data, in particular magnetic resonance apparatus, computer tomography apparatus, x-ray apparatus or ultrasound apparatus, comprising means for acquiring medical image data and means for processing said image data including an apparatus

for visualization according to claim 8 ([0167]; Fig.13; [0060]; see also discussion above with regard to claim 8).

23. As to claim 10, Bailey discloses a computer program comprising computer program means for causing a computer to perform the steps of the method as claimed in claim 1 when said computer program product is run on a computer ([0167]; see also discussion above with regard to claim 1).

24. Claims 1-2, 4 and 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication 20020106116 to Knoplioch et al. (hereinafter after referred to as "Knoplioch").

25. Regarding claim 1, Knoplioch discloses a method of visualization of a tubular structure ([0010], fist sentence) of an object by use of a 3D image data set of said object, comprising the steps of:

generating and visualizing a curved planar reformation view ([0007], "curved reformation images") from a symbolic pathway view of said tubular structure ([0010]), said symbolic pathway view representing said tubular structure and the pathway points of said symbolic pathway being assigned with their 3D spatial position data ([0032]; the centerline is the pathway, and the 3D spatial position data is inherent as the invention is dealing with 3D data sets), and

generating and visualizing at least one planar view of said object through a viewing point of said tubular structure selected in said curved planar reformation view or said symbolic pathway view ([0033], [0034], [0036]).

26. As to claim 2, Knoplioch discloses a method as claimed in claim 1, wherein said at least one planar view is generated by use of the 3D spatial position data assigned to the selected viewing point ([0033], [0034], [0036])

27. As to claim 4, Knoplioch discloses a method as claimed in claim 1, wherein said symbolic pathway view of said tubular structure is obtained following segmentation of said tubular structure in said 3D image data set ([0036], automatic segmentation of region of interest).

28. As to claim 6, Knoplioch discloses a method as claimed in claim 1, wherein the selection of said a viewing point can be interactively changed, wherein after selection of a new viewing point said at least one planar view through said new viewing point is newly generated and visualized ([0033]-[0034]).

29. As to claim 7, Knoplioch discloses a method as claimed in claim 1, wherein said tubular structure is a vessel, bone, airway, colon or spine of a patient ([0007]) and wherein said 3D image data set is a medical image data set, in particular a 3D rotational angiography, CT angiography or MR data set ([0028]).

30. As to claim 8, Knoplioch discloses an apparatus for visualization of a tubular structure of an object by use of a 3D image data set of said object, comprising:

means for storing said 3D image data ([0029], line 13);

means for generating a curved planar reformation view from a symbolic pathway view of said tubular structure, said symbolic pathway view representing said tubular structure and the pathway points of said symbolic pathway being assigned with their 3D

spatial position data ([0029], lines 9-11; [0032]; the centerline is the pathway, and the 3D spatial position data is inherent as the invention is dealing with 3D data sets) ;

means for storing said 3D spatial position data of said symbolic pathway  
(inherent in the computer 36; [0036]);

means for generating at least one planar view of said object through a viewing point of said tubular structure selected in said curved planar reformation view or said symbolic pathway view ([0033], [0034], [0036]),

means for visualizing said symbolic pathway view, said curved planar reformation view and said at least one planar view ([0033], [0034], [0036]), and

means for selecting a viewing point in said curved planar reformation view or said symbolic pathway view ([0033]-[0035]).

31. As to claim 9, Koplioch discloses an apparatus for acquiring and processing medical image data, in particular magnetic resonance apparatus, computer tomography apparatus, x-ray apparatus or ultrasound apparatus, comprising means for acquiring medical image data and means for processing said image data including an apparatus for visualization according to claim 8 ([0029]; see also discussion above with regard to claim 8).

32. As to claim 10, Koplioch discloses a computer program comprising computer program means for causing a computer to perform the steps of the method as claimed in claim 1 when said computer program product is run on a computer (paragraphs [0030]-[0032] and others refer to software; see also discussion above with regard to claim 1).

33. Claims 1-2 and 4-10 are rejected under 35 U.S.C. 102(b) as being anticipated by WIPO Publication WO 02/41767 A1 to Koo et al. (hereinafter referred to as "Koo").

34. As to claim 1, Koo discloses a method of visualization of a tubular structure (Fig.12) of an object by use of a 3D image data set of said object, comprising the steps of:

generating and visualizing a curved planar reformation view from a symbolic pathway view of said tubular structure, said symbolic pathway view representing said tubular structure and the pathway points of said symbolic pathway being assigned with their 3D spatial position data (page 16, lines 9-11; page 9, lines 5-12), and

generating and visualizing at least one planar view of said object through a viewing point of said tubular structure selected in said curved planar reformation view or said symbolic pathway view (page 16 line 16 to page 17, line 2; the cross-sectional plane is a planar view).

35. As to claim 2, Koo discloses a method as claimed in claim 1, wherein said at least one planar view is generated by use of the 3D spatial position data assigned to the selected viewing point (page 16 line 16 to page 17, line 2; the cross-sectional plane is a planar view).

36. As to claim 4, Koo discloses a method as claimed in claim 1, wherein said symbolic pathway view of said tubular structure is obtained following segmentation of said tubular structure in said 3D image data set (page 11, lines 1-4; the structure is effectively segmented).

37. As to claim 5, Koo discloses a method as claimed in claim 1, wherein said step of generating and visualizing said curved planar reformation view includes a step of selecting a viewing direction and a viewing up direction determining the viewing angle of said curved planar reformation view (page 12, lines 1-5; page 19, lines 3-7; the viewing direction is freely controlled, and therefore can be any direction).

38. As to claim 6, Koo discloses a method as claimed in claim 1, wherein the selection of said a viewing point can be interactively changed, wherein after selection of a new viewing point said at least one planar view through said new viewing point is newly generated and visualized (page 12, lines 1-5; page 19, lines 3-7).

39. As to claim 7, Koo discloses method as claimed in claim 1, wherein said tubular structure is a vessel, bone, airway, colon or spine of a patient (Fig.12, shows an airway) and wherein said 3D image data set is a medical image data set, in particular a 3D rotational angiography, CT angiography or MR data set (page 10, last paragraph).

40. As to claim 8. Apparatus for visualization of a tubular structure of an object by use of a 3D image data set of said object, comprising:

means for storing said 3D image data (page 8, lines 10-11);

means for generating a curved planar reformation view from a symbolic pathway view of said tubular structure, said symbolic pathway view representing said tubular structure and the pathway points of said symbolic pathway being assigned with their 3D spatial position data (page 8, lines 14-21; page 16, lines 9-11; page 9, lines 5-12);

means for storing said 3D spatial position data of said symbolic pathway (page 8, lines 10-11);

means for generating at least one planar view of said object through a viewing point of said tubular structure selected in said curved planar reformation view or said symbolic pathway view (page 16, lines 16-20),

means for visualizing said symbolic pathway view, said curved planar reformation view and said at least one planar view (page 18), and

means for selecting a viewing point in said curved planar reformation view or said symbolic pathway view (page 18 to page 19, line 7).

41. As to claim 9, Koo discloses an apparatus for acquiring and processing medical image data, in particular magnetic resonance apparatus, computer tomography apparatus, x-ray apparatus or ultrasound apparatus, comprising means for acquiring medical image data and means for processing said image data including an apparatus for visualization according to claim 8 (see page 8; see also discussion above for claim 8).

42. As to claim 10, Koo discloses a computer program comprising computer program means for causing a computer to perform the steps of the method as claimed in claim 1 when said computer program product is run on a computer (page 2, last sentence; see also discussion provided above for claim 1).

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JON CHANG whose telephone number is (571)272-7417. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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